

**Table S1** Statistics of four metrics from 1991 to 2021

Year	Index	PC1	PC2	PC3	PC4
1991	NDVI	0.654	0.554	-0.274	0.437
	Wet	0.275	-0.577	0.467	0.612
	NDSI	-0.697	0.204	-0.200	0.658
	LST	-0.109	0.565	0.817	-0.042
	Covariance eigenvalue of each PC	0.018	0.002	0.001	0.000
	Percent covariance eigenvalue (%)	83.81	10.23	4.50	1.46
1992	NDVI	0.605	0.587	-0.238	0.482
	Wet	0.390	-0.571	0.546	0.474
	NDSI	-0.653	-0.003	-0.176	0.736
	LST	-0.234	0.574	0.784	-0.018
	Covariance eigenvalue of each PC	0.028	0.004	0.002	0.000
	Percent covariance eigenvalue (%)	82.42	11.74	4.78	1.06
1993	NDVI	0.671	0.493	-0.444	0.330
	Wet	0.204	-0.315	0.526	0.764
	NDSI	-0.682	0.151	-0.451	0.555
	LST	-0.206	0.797	0.568	-0.008
	Covariance eigenvalue of each PC	0.022	0.002	0.001	0.000
	Percent covariance eigenvalue (%)	86.75	9.27	3.11	0.87
1994	NDVI	0.653	0.494	-0.386	0.424
	Wet	0.231	-0.335	0.658	0.633
	NDSI	-0.683	0.089	-0.334	0.644
	LST	-0.231	0.797	0.553	-0.069
	Covariance eigenvalue of each PC	0.021	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	84.58	10.77	3.57	1.08
1995	NDVI	0.619	0.552	-0.171	0.531
	Wet	0.370	-0.518	0.697	0.331
	NDSI	-0.632	-0.052	-0.069	0.770
	LST	-0.282	0.651	0.693	-0.126
	Covariance eigenvalue of each PC	0.026	0.005	0.002	0.000
	Percent covariance eigenvalue (%)	79.92	14.15	4.93	1.00
1996	NDVI	0.669	0.533	-0.202	0.478
	Wet	0.282	-0.455	0.732	0.421
	NDSI	-0.616	0.017	-0.191	0.764
	LST	-0.304	0.714	0.622	-0.107
	Covariance eigenvalue of each PC	0.027	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	82.71	12.28	4.13	0.88
1997	NDVI	0.621	0.516	-0.364	0.464
	Wet	0.283	-0.324	0.719	0.546
	NDSI	-0.663	-0.021	-0.277	0.695
	LST	-0.307	0.793	0.524	-0.060
	Covariance eigenvalue of each PC	0.029	0.005	0.001	0.000
	Percent covariance eigenvalue (%)	81.30	13.71	4.15	0.84
1998	NDVI	0.584	0.471	-0.475	0.460
	Wet	0.290	-0.210	0.722	0.592
	NDSI	-0.686	-0.092	-0.293	0.660

	LST	-0.325	0.852	0.409	-0.037
	Covariance eigenvalue of each PC	0.028	0.005	0.001	0.000
	Percent covariance eigenvalue (%)	81.48	13.90	3.83	0.78
1999	NDVI	0.609	0.541	-0.345	0.466
	Wet	0.347	-0.356	0.716	0.490
	NDSI	-0.639	-0.053	-0.220	0.735
	LST	-0.316	0.760	0.566	-0.050
	Covariance eigenvalue of each PC	0.027	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	83.53	11.22	4.43	0.82
2000	NDVI	0.660	0.524	-0.387	0.375
	Wet	0.270	-0.225	0.726	0.591
	NDSI	-0.585	-0.055	-0.381	0.714
	LST	-0.387	0.819	0.421	-0.029
	Covariance eigenvalue of each PC	0.024	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	83.56	11.53	4.18	0.72
2001	NDVI	0.673	0.506	-0.447	0.304
	Wet	0.213	-0.168	0.627	0.730
	NDSI	-0.591	-0.043	-0.523	0.612
	LST	-0.390	0.845	0.365	-0.006
	Covariance eigenvalue of each PC	0.027	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	85.26	10.47	3.66	0.61
2002	NDVI	0.671	0.518	-0.377	0.373
	Wet	0.280	-0.232	0.740	0.566
	NDSI	-0.580	-0.035	-0.353	0.734
	LST	-0.369	0.822	0.431	-0.044
	Covariance eigenvalue of each PC	0.022	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	79.82	15.57	3.88	0.73
2003	NDVI	0.690	0.523	-0.313	0.389
	Wet	0.300	-0.280	0.780	0.473
	NDSI	-0.547	-0.032	-0.280	0.788
	LST	-0.366	0.804	0.464	-0.056
	Covariance eigenvalue of each PC	0.019	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	78.30	16.75	4.20	0.75
2004	NDVI	0.567	0.551	-0.309	0.529
	Wet	0.368	-0.336	0.767	0.404
	NDSI	-0.645	-0.123	-0.135	0.742
	LST	-0.356	0.754	0.545	-0.086
	Covariance eigenvalue of each PC	0.021	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	78.94	14.99	5.10	0.97
2005	NDVI	0.608	0.529	-0.319	0.498
	Wet	0.302	-0.405	0.697	0.509
	NDSI	-0.681	-0.009	-0.220	0.699
	LST	-0.276	0.745	0.603	-0.069
	Covariance eigenvalue of each PC	0.023	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	82.15	12.01	4.92	0.92
2006	NDVI	0.642	0.510	-0.393	0.416
	Wet	0.264	-0.307	0.681	0.611
	NDSI	-0.651	-0.001	-0.352	0.673

	LST	-0.308	0.803	0.509	-0.030
	Covariance eigenvalue of each PC	0.022	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	83.37	11.70	4.24	0.69
2007	NDVI	0.632	0.495	-0.403	0.439
	Wet	0.255	-0.281	0.707	0.596
	NDSI	-0.654	-0.042	-0.346	0.671
	LST	-0.327	0.821	0.466	-0.027
	Covariance eigenvalue of each PC	0.027	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	84.56	11.35	3.39	0.69
2008	NDVI	0.531	0.488	-0.480	0.500
	Wet	0.252	-0.190	0.724	0.614
	NDSI	-0.709	-0.164	-0.314	0.610
	LST	-0.391	0.836	0.383	-0.033
	Covariance eigenvalue of each PC	0.022	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	82.88	13.42	3.01	0.69
2009	NDVI	0.631	0.559	-0.312	0.437
	Wet	0.276	-0.315	0.737	0.530
	NDSI	-0.623	-0.027	-0.298	0.723
	LST	-0.369	0.766	0.520	-0.076
	Covariance eigenvalue of each PC	0.028	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	85.17	10.68	3.39	0.76
2010	NDVI	0.573	0.603	-0.302	0.465
	Wet	0.341	-0.339	0.726	0.491
	NDSI	-0.634	-0.080	-0.235	0.732
	LST	-0.391	0.718	0.571	-0.077
	Covariance eigenvalue of each PC	0.030	0.003	0.001	0.000
	Percent covariance eigenvalue (%)	85.32	9.89	4.13	0.66
2011	NDVI	0.614	0.469	-0.485	0.411
	Wet	0.244	-0.213	0.669	0.669
	NDSI	-0.693	-0.018	-0.371	0.618
	LST	-0.290	0.857	0.423	-0.045
	Covariance eigenvalue of each PC	0.030	0.004	0.001	0.000
	Percent covariance eigenvalue (%)	84.48	11.76	3.21	0.55
2012	NDVI	0.692	0.393	-0.445	0.411
	Wet	0.249	-0.241	0.725	0.595
	NDSI	-0.633	-0.004	-0.350	0.691
	LST	-0.242	0.887	0.392	-0.018
	Covariance eigenvalue of each PC	0.033	0.005	0.002	0.000
	Percent covariance eigenvalue (%)	81.41	13.38	4.70	0.51
2013	NDVI	0.726	0.388	-0.417	0.385
	Wet	0.261	-0.206	0.768	0.547
	NDSI	-0.571	-0.043	-0.347	0.743
	LST	-0.282	0.897	0.340	-0.005
	Covariance eigenvalue of each PC	0.038	0.005	0.002	0.000
	Percent covariance eigenvalue (%)	84.59	10.83	4.21	0.36
2014	NDVI	0.693	0.503	-0.286	0.430
	Wet	0.299	-0.411	0.718	0.476
	NDSI	-0.581	-0.010	-0.273	0.767

	LST	-0.305	0.760	0.573	-0.017
	Covariance eigenvalue of each PC	0.039	0.004	0.002	0.000
	Percent covariance eigenvalue (%)	85.85	9.36	4.37	0.42
2015	NDVI	0.701	0.449	-0.376	0.406
	Wet	0.253	-0.268	0.748	0.552
	NDSI	-0.588	-0.036	-0.352	0.728
	LST	-0.315	0.851	0.419	-0.010
	Covariance eigenvalue of each PC	0.039	0.004	0.002	0.000
	Percent covariance eigenvalue (%)	86.90	8.77	3.95	0.38
2016	NDVI	0.651	0.502	-0.318	0.473
	Wet	0.303	-0.419	0.697	0.497
	NDSI	-0.633	-0.030	-0.262	0.727
	LST	-0.289	0.756	0.587	-0.009
	Covariance eigenvalue of each PC	0.038	0.003	0.002	0.000
	Percent covariance eigenvalue (%)	88.05	7.08	4.46	0.41
2017	NDVI	0.657	0.416	-0.449	0.440
	Wet	0.279	-0.226	0.747	0.559
	NDSI	-0.634	-0.080	-0.313	0.703
	LST	-0.298	0.877	0.377	-0.001
	Covariance eigenvalue of each PC	0.035	0.003	0.002	0.000
	Percent covariance eigenvalue (%)	87.72	7.63	4.28	0.37
2018	NDVI	0.648	0.490	-0.370	0.450
	Wet	0.332	-0.310	0.752	0.477
	NDSI	-0.600	-0.091	-0.252	0.754
	LST	-0.332	0.810	0.484	-0.005
	Covariance eigenvalue of each PC	0.039	0.004	0.002	0.000
	Percent covariance eigenvalue (%)	86.67	8.19	4.79	0.35
2019	NDVI	0.676	0.525	-0.287	0.430
	Wet	0.315	-0.388	0.730	0.466
	NDSI	-0.573	-0.042	-0.268	0.773
	LST	-0.339	0.757	0.559	-0.017
	Covariance eigenvalue of each PC	0.036	0.003	0.002	0.000
	Percent covariance eigenvalue (%)	87.70	7.42	4.56	0.32
2020	NDVI	0.679	0.475	-0.358	0.430
	Wet	0.273	-0.287	0.759	0.518
	NDSI	-0.591	-0.064	-0.316	0.740
	LST	-0.340	0.829	0.443	-0.011
	Covariance eigenvalue of each PC	0.033	0.003	0.002	0.000
	Percent covariance eigenvalue (%)	87.50	7.87	4.32	0.32
2021	NDVI	0.678	0.493	-0.323	0.439
	Wet	0.292	-0.387	0.713	0.507
	NDSI	-0.609	-0.008	-0.283	0.741
	LST	-0.290	0.779	0.555	-0.018
	Covariance eigenvalue of each PC	0.034	0.003	0.002	0.000
	Percent covariance eigenvalue (%)	86.83	7.80	4.97	0.40